

Eco Team comments on the LWG's proposed Assessment Endpoint Table
including changes to the table, justification, and data needs

Receptor of Concern	Assessment Endpoint	Measures of Effect and Exposure	Changes to the table (identified by the Eco Team)	Justification for the changes	Data needs (captured in the Data Needs Table)
Benthic					
The benthic community	Survival, growth and reproduction	Sediment toxicity testing to assess effects (direct toxicity and/or a predictive approach will be evaluated).	Add to Measures of E&E: (1) tissue residue (most conservative tissue based TRVs in literature) to measures of e & e for clams, multiplate organisms, Lumbriculus, (2) add a second box to E&E for groundwater discharge areas; methodology look at existing bioassay tests, and either collect tissue from groundwater discharge areas or do in-situ testing, comparing values to AWQC.	The two tests being run (10 and 28 day tests) may not represent full exposure in the field for bioaccumulants.	(1) Collect epibenthic invertebrates (put structures in the sediment), and (2) put out more multiplates to collect more tissue.
Shellfish (bivalves)	Survival, growth and reproduction	Tissue-based TRVs (provided sufficient clam tissue can be obtained) and benthic bioassay toxicity testing. For TBT, derive a site specific biota-sediment accumulation factor or use screening value based on sediment concentrations ¹ .	In the LWG's "Where addressed?" column, change to "Following tissue collection <i>and bioaccumulation studies</i> in Fall 2005"		In-situ caged studies to better represent site-specific exposure.
Crayfish	Survival, growth and reproduction	Tissue based TRV approach.			Potential data gap - we need to determine whether we have enough data to assess crayfish for the FWM; look at where they've been collected and where we want the mcollected to determine if data gap exists; also look at habitat areas
Fish					
Invertivore					
Juvenile Chinook Salmon ²	Survival and growth	A combination of dietary TRV and tissue based TRV approach. For metabolized COPCs, determine potential exposure through diet, tissue, and/or biomarker analysis and assess potential effects on survival and growth. Compare water concentrations to AWQC criteria and literature-based values for protection of early life stages of salmonids.	(1) Need to make sure that TRVs consider reproductive effects. (2) For "assessment endpoint," Tribes want behavior (immunocompetence) to be assessed as an additional endpoint, unless TRVs quantitatively link behavior to survival (Burt or Parametrix to review TRVs).		

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Peamouth	Survival, growth and reproduction	A combination of dietary and tissue based TRV approach. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages.			Reexamine peamouth and juvenile Chinook diets to determine how similar they are, and decide whether peamouth is an adequate representative of juvenile Chinook
Sculpin ²	Survival, growth and reproduction	A combination of dietary and tissue based TRV approach. For metabolized COIs, determine potential exposure through diet and/or biomarker analysis and assess potential effects on survival, growth, and reproduction. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages.		(1) Need clarification on what we're using the biomarker data for and how or whether we'll develop a biomarker TRV (this applies to all receptors ath mention biomarker analysis). (2) Issue: tissue and sediment samples were not properly co-located; flawed methodology (applies to crayfish also).	Need additional co-located sculpin tissue data with sediment data to assess exposure to transition zone water, localzied risk at certain sites, and temporal dynamics in the river (note: we need to determine the conditions under which we will assess the sculpin groundwater pathway; not everywhere)
Omnivore/Herbivore					
Carp (Surrogate Fish Tissue) ^{3,4}	Survival, growth and reproduction	Tissue-based TRV approach for dioxin-likecontaminants using literature values and incorporating toxic equivalent (TEQs) based on the World Health Organization toxic equivalent factors (TEFs). Risk from other compounds assessed in uncertainty analysis.	Note: not important to assess carp as an endpoint, but as a pathway (important for mink)		
Largescale Sucker ^{2,3,5}	Survival, growth and reproduction	A combination of dietary and tissue based TRV approaches. For metabolized COIs, determine potential exposure through diet, and/or biomarker analysis and assess potential effects on survival, growth, and reproduction. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages. Incorporate sediment ingestion as part of the dietary TRV. Note prevalence of external lesions or tumors.			Possible data need: analyze fish eggs collected on multiplates to help assess reproduction.
White Sturgeon	Survival, growth and reproduction	A combination of dietary and tissue based TRV approaches. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages. Modeling and/or additional data collection will be required if current data is inadequate to assess exposure and effects. ⁷	Note: Unless LWG wants to do studies to determine sturgeon presence and residence time in ISA, LWG must assume 100% site fidelity for all sturgeon assessment endpoints to determine predictive risk in the screening level risk assessment.	(1) Sturgeon are more sensitive than other species. (2) The sturgeon's long lifetime is not represented; we need to learn more about this.	Need site-specific data (field collected tissue) and lab data (exposure in lab) to deterine contaminant concentrations in adults and ammocoetes, toxicity and bioaccumulation.

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Smallmouth Bass	Survival, growth and reproduction	A combination of dietary and tissue based TRV approaches. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages.		We need to understand variability of tissue concentrations in individual fish in the ISA; important for the FWM and for understanding what populations are exposed to (note: we may want to run a localized FWM in certain areas). We only have 6 composite samples for small mouth bass, and only 3 samples for other species. This corresponds to the need to redo co-located sediment-sculpin sampling to develop a relationship between the two (if can't determine a relationship, will need to collect more data in areas where needed).	Additional studies needed to understand variability of tissue concentrations in individual fish (could be small mouth bass, sculpin and/or clams; depends on what species we decide are critical for the FWM) in SMAs of interest.
Piscivores					
Northern Pikeminnow	Survival, growth and reproduction	A combination of dietary and tissue based TRV approaches. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages.			
Detritivores					
Pacific Lamprey Amocoetes	Survival and growth	Tissue residue concentrations compared to relevant TRV or surrogate. In absence of tissue data, modeling to determine dietary and tissue concentrations. Compare water concentrations to literature-based or AWQC criteria for protection of early life stages.	Add more options for measures of effect and exposure (i.e., in-situ study to determine rate of uptake, toxicity tests with site sediment, lab accumulation tests, modeling, etc.)	Ammocoetes are an important endpoint themselves because of cultural and dietary significance to Tribes, and the lamprey's high lipid content makes them a critical pathway to assess in the FWM.	We need a reasonable estimate of ammocoete tissue concentrations; can weigh cost-effectiveness of site collection of ammocoetes vs. lab studies. Eco Team subgroup will (1) develop a proposal for ammocoete site-collection, using Tribal biologist expertise, to present to the group, and (2) determine what contaminants we need to be concerned about by mid-November.
Wildlife					
Bald Eagle	Survival, growth and reproduction	Dietary-based approach incorporating food chain transfer of contaminants from appropriate fish species (assuming all exposure comes from prey fish). Assess dioxin-like contaminants using a TEQ approach based on appropriate surrogate fish tissue data. Use TRVs based on the most sensitive life stages, which include egg or embryo-based TRVs for DDT and metabolites, PCBs, and dioxin-like compounds. Egg concentrations will be determined by egg analysis or by food chain modeling.		Need to understand contaminant concentrations in Bald eagle eggs to validate the FWM and assess risk to eagles.	Collect Bald eagle eggs and/or shells from nests.

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Hooded Merganser	Survival, growth and reproduction	Dietary based TRV approach. Dietary based analysis using sculpin and/or invertebrate tissue data to represent feeding guild. In the absence of appropriate fish and invertebrate tissue concentrations, modeled concentrations will be used. For dioxin like contaminants (carp or appropriate prey species), use a TEQ-based approach to assess reproductive effects.	Note: In Measures of E&E, the LWG needs to do two ingestion scenarios - 100% invertebrates and 100% fish - for a conservative scenario (make sure it's not split 50% - 50%).		
Osprey	Survival, growth and reproduction	Dietary-based approach incorporating food chain transfer of contaminants from appropriate fish species (primarily pikeminnow and sucker). Assess dioxinlike contaminants using a TEQ approach based on appropriate surrogate fish tissue data. Use TRVs based on the most sensitive life stages, which include egg or embryo-based TRVs for DDT and metabolites, PCBs, and dioxin-like compounds. Egg concentrations will be determined by egg analysis or by food chain modeling.		Need to understand contaminant concentrations in osprey eagle eggs to validate the FWM and assess risk to osprey.	Analyze osprey eggs (USGS has eggs from the ISA; needs \$ to analyze and document results).
Spotted Sandpiper ³	Survival, growth and reproduction	Dietary based TRV approach. Sediment concentrations determined from site specific evaluation. In the absence of appropriate invertebrate tissue concentrations, use modeled invertebrate tissue concentrations.			
Mink ⁶	Survival, growth and reproduction	Dietary based TRV approach, considering both relevant fish species concentrations and invertebrate (crayfish) components of the diet. For dioxin-like contaminants (carp or appropriate prey species), use a TEQ-based approach to assess reproductive effects.	(1) Need to ensure that the LWG uses two ranges of diet - one for mink and one for otter. (2) Need to analyze the larger mussels for diet, and could concentrate sampling/analysis on larger habitat areas for mink, otter, mussels (i.e., Rhone Poulenc).	Otter has a different diet than mink (feeds on carp).	Collect clams and mussels to estimate dietary uptake for mink, otter and sturgeon.
Amphibians	Survival, growth and reproduction	Water concentrations compared to literature-based values or AWQC to protect sensitive life stage.	Note: make sure that we don't refer to amphibians or birds as "surrogates" for reptiles; rather, we assume that protecting surrogates and birds will ensure protection of reptiles.		
Plants					
Aquatic Plants	Survival, growth and reproduction	Comparison of emergent aquatic plant exposure based on concentrations of chemicals in sediment and relevant toxicological data.		Additional plant data may be needed for the FWM and understanding fish diets (Parametrix is looking into this).	Potential data needs: (1) Need sediment/soil data near specific emergent/aquatic plants of concern. (2) Collect plant tissue for concentration analysis for in-water plants.

Footnotes:

¹ For TBT, suggested screening value of 6,000 ng/g OC (based on 2 % OC), which represents a dry wt conccentration of 120 ng/g.

² Considered representative of fish exposure to PAHs. Analysis should include an analysis of whether these compounds are found in the diet of the fish receptors, as well as if found in tissue analysis.

³ Considered representative of sediment ingestion.

⁴ Carp is not a receptor of concern for the ecological risk assessment.; whole-body fish tissue (i.e., carp) was analyzed for dioxin-like chemicals, including PCB congener analysis, and is a surrogate for other fish species for these chemicals.

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⁵Represents a resident broadcast spawner. Therefore, exposure to sensitive early life stages and eggs will be assessed to all contaminants, including PAHs and dioxin like compounds.

⁶Mink was selected to also represent river otter. Therefore, the dietary requirements of the river otter, which include a fish diet, must be assessed.

⁷Possible approaches for sturgeon will be developed through the ecological risk assessment TM process and the approach for the site will be selected following discussions between the LWG, EPA and its partners.